

SOME INDIANA ACRIDIDÆ.—III.

BY W. S. BLATCHLEY, TERRE HAUTE, INDIANA.

In the two preceding papers of this series 36 species and 3 varieties of Acrididæ have been recorded as occurring in Indiana. Since the last paper, published in the ENTOMOLOGIST for February, 1892, appeared, five additional species have been taken within the State, and many facts have been gathered concerning the life history, habits and range of the species previously recorded. Moreover, my private collection has been largely increased by exchange for specimens from other parts of the United States, and I have possessed myself of almost all the literature extant upon the group, so that I am enabled to clear up a few mistakes in synonymy which crept into my first papers.

ACRIDIDÆ.

ACRIDINÆ.

OEDIPODINI.

I. AULOCARA SCUDDERI, Bruner.

Aulocara Scudderi, Bruner, Proc. U.S. Nat. Mus., XII., 1890, 63.

This small locust was first taken in Indiana on July 6th, 1892, from the sandy bed of the old Wabash and Erie Canal, five miles north of Terre Haute, Vigo Co. Other specimens were secured at the same locality in September of that year, and in September and October of 1893.

On one side of the canal, at the point mentioned, is a large pond, occupying perhaps 50 acres of the Wabash River bottoms, and on the other side is a sandy hill or bluff of the river, which is covered with typical prairie grasses and plants. The locust has been found only in an area of about five acres, on the side of the hill, and in the bed of the canal. When disturbed it leaps vigorously, and without noise, for several times in succession; then, settling down on a sandy spot, it will allow a close approach, evidently relying upon the similarity of colour between its body and the sand to shield it from observation. According to Bruner, *loc. cit.*, it is a very common species west of the Mississippi; but this I believe, is its first record east of that stream, unless the species mentioned by McNeill, in his "Illinois Orthoptera,"* as *Philobostroma parva* (?), be the same.

*Psyche, VI., 64.

2. SPHARAGEMON OCULATUM, Morse.

Spharagemon oculatum, Morse, Proc. Bost. Soc. Nat. Hist.,
XXVI., 1894, 232.

On August 1, 1892, I visited Lake Maxinkuckee, Marshall Co., Indiana, and in a sandy, fallow field, near the south-western border of the lake, I found this locust to be quite abundant in company with *Spharagemon bolli*, Scudder. They never leaped when disturbed, but used the wings to propel them in a flight of about 30 yards; the males making a faint crackling noise as they cleared themselves from the earth, while the females were noiseless. A number of pairs were taken in copulation on this date.

On August 17, 1893, I again visited the locality, and found the field to be in corn, but the *Spharagemon* was very common over about two acres of the most sandy portion. Resting on the soil between the rows, they were very difficult of detection, and eight times out of ten were not seen until flushed, unless they had previously been "marked down" as they alighted. A few were also taken from the sandy margin of the lake, but careful search over a wide extent of territory failed to reveal them elsewhere.

Without specimens for comparison, and from the literature at hand, I determined them doubtfully as *Spharagemon collare*, Scudder, and sent specimens so named to Prof. A. P. Morse, who was making a detailed study of the genus. He found that they differed from the type specimens of *collare* in Mr. Scudder's collection, and so described them as new, under the name cited above.

3. TRIMEROTROPIS MARITIMA (Harris). The Maritime Locust.

Locusta maritima, Harris, Ins. Inj. to Veg., 1862, 178.

Oedipoda maritima, Uhler, in Harris Rep., *loc. cit.*

Scudder, Bost. Journ. Nat. Hist.

VII., 1862, 472.

Thomas, Syn. Acrid, N. A., 1873, 124.

Trimerotropis maritima, Stal, Recens. Orth., I., 1873, 135.

Scudder, Dist. Ins. N. Hamp., 1874, 378.

Thomas, Ninth Rep. St. Ent., Ill., 1880, 113.

Fernald, Orth., N. Eng., 1888, 45.

Among a number of Orthoptera which were collected by Prof. E. E. Slick at Michigan City, Indiana, on September 18, 1892, and forwarded to me, was a single ♀ of this species. I immediately returned it to him with the request that, if possible, he secure a number of others. On October 15, there having been several severe frosts in the meantime, he sent 18 additional specimens, 6 of which were ♂'s. At the same time he wrote concerning them as follows: "Some were found dead and others could but jump one or two feet. I did not realize when the first lot was sent how nearly these were like the sand, because they were so wild. They were never more than 100 feet from the edge of the water (Lake Michigan), and never along even the hillsides."

The only record which has come under my notice of the occurrence of *maritima* west of the Atlantic coast is the brief one given by Thomas in his Ninth Illinois Report, *loc. cit.*, where he says: "This has been discovered only in the extreme northern part of the State;" but he does not state when nor by whom it was taken. McNeill includes it in his list of the Illinois Orthoptera (PSYCHE VI., 64), on the strength of the above statement by Thomas.

Mr. Scudder, in his Distribution of Insects in N. Hamp., *loc. cit.*, writes of it as follows: "This curious grasshopper is a good example of mimicry, for it so closely resembles the colour of the sand on a sea beach that it is difficult to see it when alighted. It is found only in such localities, and reaches its northern limit about the narrow part of the State washed by the sea. South-west it extends at least as far as New Jersey."

TETTIGINÆ.

4. TETTIX ARENOSUS, Burmeister,

Tettix arenosa, Burmeister, Handbuch II., 1838, 659.

Tettix arenosus, Scudder, Proc. Bost. Soc. Nat. Hist., XIX., 1877, 90.

Bolivar, Essai Sur. les. Tettig., 1887, 95.

Tettix ornatus, Scudder, Bost. Jour. Nat. Hist., VII., 1862, 474 (In part.)

Thomas, Syn. Acrid., 1873, 184 (In part.)

(Not *Tettix ornatus*, Say.)

In Indiana this grouse locust is much less common than *T. ornatus*, Say, with which species it has been confounded by many writers. Burmeister's description was so short and unsatisfactory that unless one could examine his types it is impossible to determine what species he had at hand.

Bolivar, in his "Essai," separates the group containing *ornatus* from that containing *arenosus* by the difference in the relative length of the pronotum, but collectors of these insects know that this character is of little value on account of its great variation in the same species. Moreover, he gives the length of pronotum of *ornatus* as 7.5-9 mm., and states that it does not exceed the tip of the posterior femora. A glance at Say's description and figure will show that he was wrong concerning both of these points, as the length of pronotum there, and the average length in many specimens at hand, is about 11.5 mm.

Arenosus, as I have it separated in my collection, is a somewhat shorter and broader species than *ornatus*, and with the median carina of the pronotum and vertex much more distinct. The granulations on the pronotum are longer and more irregularly distributed, and, especially on the posterior half, have a tendency to arrangement in short, oblique waves or ridges, while the median sulcus of the face is wider in its lower half than in *ornatus*.

The general colour of *arenosus* is darker and the annulations of the antennæ and legs are much more distinct than in *ornatus*, which in colour is an exceedingly variable insect. But little practice is necessary to quickly distinguish the two species in the field.

Arenosus in this vicinity is found in small numbers about gravelly hillsides, and occasionally in company with *T. cucullatus* about the borders of streams, while *ornatus* is a very common species in dry upland woods.

5. *TETTIX GRANULATUS* (Kirby).

Acridium granulatum, Kirby, "Fauna Bor. Am., IV., 1837, 251."

Tettix granulatus, Scudder, Bost. Journ. Nat. Hist., VII., 1862, 474.

Thomas, Syn. Acrid. N. A., 1873, 182.

Bethune, Can. Ent. VII., 1875, 130. (Copy of Orig. Desc.)

Riley, Rep. U. S. Ent. Comm., I., 1877, 256, fig. 11.

Bolivar, Essai Sur. les Tettig., 1887, 91.

McNeill, Psyche, VI., 1891, 77.

Tettix ornata, Harris, Ins. Inj. to Veg., 1862, 186. (Not
Tettix ornatus, Say.)

I have found this species in both Vigo and Fulton counties, and McNeill, *loc. cit.*, has recorded it from Franklin Co., Ind.

In Vigo Co. it is evidently scarce, as I have taken it only in winter from beneath logs, in the vicinity of the large pond mentioned above, under *Aulocara Scudderi*. In Fulton Co., 150 miles north, I found it very common in the depths of a tamarack swamp, in company with *Tettigidea polymorpha*, Burm.

In life, the inner wings of *gravulatus* are bluish or bottle green, a character I do not remember to have seen noted by any previous writer.

It is an insect of wide distribution, extending from ocean to ocean, and northward through British America. Vigo county is probably near the southern limit of its range.

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NOTES ON SOME OF THE SPECIES MENTIONED IN THE PREVIOUS PAPERS.

LEPTY SMA MARGINICOLLIS, Serville. (C. E., XXIV., 28.*)

The only habitat of this species in Indiana, known to date, is the margin of the large river bottom pond mentioned in my previous paper. This has been partially drained, and, as a result, the locust was quite scarce in the autumn of 1893. I was much surprised, however, to find there, on May 21st, a fully developed male, with soft, flabby wings, as though just moulted, though no others of any age were seen on that date.

TRUXALIS BREVICORNIS, Linn. (C. E., XXIII., 75.)

This has proven to be a rather common species about the margins of marshes, ponds and lakes. In Vigo county it reaches maturity about August 10th. It has been taken in Fulton and Marshall counties, thus extending its known range 150 miles northward.

CHRYSOCHRAON VIRIDIS, Scudder. (C. E., XXIII., 75.)

The brown form of this species far outnumbers the green one in this locality. It has been taken in copulation as early as July 15. The spring and early summer of 1892 were very damp, it raining almost every day in the month of May. In the latter part of July hundreds of dead and dying specimens of this species and of *Melanoplus bivittatus*, Say, were

*The references refer to the volume of Can. Ent. in which the species was previously mentioned by myself.

to be seen in the tops of iron weeds. They were principally ♀'s, and their death was probably due to the insect fungus, *Entomophthora calopteni*, Bessey, an interesting account of which appeared in Bull. 22, U. S. Dept. Agr., 1890, 104. The disease was, perhaps, more abundant on account of the young being exposed to so much dampness in May and June. In two instances females of *Melanoplus differentialis*, Thomas, were discovered feeding upon the dead bodies of *C. viridis*, the abdomens and soft portions of the thorax having been wholly devoured.

CHLOEALTI^S CONSPERSA, Harris. (C. E., XXIII., 75.)

The ♂'s of this species are among the rarest locusts found in Indiana. Six years collecting have yielded me not more than as many perfect specimens. The ♀'s are by no means common, seldom more than four or five being seen in a day's collecting.

Mr. S. I. Smith* and Mr. S. H. Scudder† have each given an interesting account of the egg laying habits of the ♀ *conspersa*. On August 11th, 1893, I discovered a ♀ in the act of boring a hole in the upper edge of the topmost board of a six-plank fence. The abdomen was curved downward, and the forcipate valves of the ovipositor used as pinchers with which small pieces of the wood were broken off. When discovered, the abdomen was inserted nearly one-half an inch in the pine board, and the upper edge of the opening about the sides of abdomen was covered with small pieces of wood, just as the dust or borings will accumulate about the edge of a hole which a carpenter is boring.

I stood by and watched her work for ten or more minutes, when she suddenly stopped, withdrew her ovipositor and hopped away. Along the fence, within a distance of 30 feet, I found 15 other holes, 11 of which were fresh, while the others had evidently been bored the previous year. Most of these were on the upper edge of the top board, which was in all cases of pine and perfectly sound. None of the holes contained eggs, most of them being less than half-an-inch in depth.

On September 21st I found two ♀'s ovipositing in the sides of a rotten stump. Their abdomens were inserted their full length, and when removed eggs were found in the lower horizontal portion of each cavity.

CHLOEALTI^S CURTIPENNIS, Harris. (C. E., XXIII., 76.)

This has proved to be a very abundant species among the tall grasse of the low, damp prairies of Northern Indiana.

*Rep. Conn. Board of Agric., 1872, 375.

†"Distribution of Insects in New Hampshire," 371.

PEZOTETTIX GRACILIS, Bruner. (C. E., XXIII., 81.)

Mature specimens have been taken as early as June 25th. By July 4th it is common, especially upon the iron weeds (*Vernonia fasciculata*, Mich.) which grow abundantly in low, open woods. It has been found in copulation at this date and as late as November 10th, though whether there is more than one brood each season, I have not been able to ascertain.

(To be continued.)

A LEAF-TISSUE GALL ON MOUNTAIN COTTONWOOD.

BY C. H. TYLER TOWNSEND, KINGSTON, JAMAICA.

A fleshy leaf-tissue gall was found on terminal twigs of *Populus Monilifera* (?) June 18, 1892, a few miles to the north of Ojo Caliente, in Southern Socorro county, New Mexico. This gall is somewhat similar in method of formation to one that has been found on *Rhus microphylla*, which possesses a cock's-comb-like appearance.

Gall.—Diameter (after being thoroughly dried and much shrunken) of four galls: 15 by 12 mm.; 17 by 19 by 14 mm.; 20 by 14 mm.; 22 by 20 by 18 mm.; the length (extent on stem) being less than width. Gall rather irregular in outline, fleshy, growing more or less in irregular sections, clustered together around the twig, but springing from side stems, consisting of a mass of fleshy, abnormally developed and degraded leaf-tissue massed together. Colour, red on all surface exposed to the sun; the lower or inner surface next the centre of the tree, when not so exposed, but sheltered by the foliage, greenish. The irregularity of the external surface of the gall is due to the various groups of massed leaf-tissue being independently and unequally developed, with spaces between.

Four galls. Two cast skins were found on the surface of these. The skins appear to be hemipterous, possibly homopterous. The fleshy sections of tissue contain cavities within, but there is no trace of the gall maker.